

Supplemental Preliminary Amendment S6302

Amendments to the Claims

This listing of claims will replace the pending claims in the application.

Listing of Claims:

Claims 1 – 7 (cancelled).

Claim 8 (currently amended): An apparatus for separating at least one component of a gas mixture by pressure swing adsorption, comprising, ~~in a generally vertical vessel (1) comprising :~~

an upper dome (2), ~~at least one adsorbent mass (4) separating :~~

a bottom end (3);

generally vertically extending walls extending from the bottom end (3) to the upper dome (2) thereby enclosing a space;

a first vertical chamber (5) ~~receiving~~ adapted and configured to receive the gas mixture to be separated, ~~from ;~~

a second vertical chamber (7) ~~collecting~~ adapted and configured to collect a separated gas mixture ~~[[.]] ;~~

at least one adsorbent mass (4) separating the first and second vertical chambers;

a ballast (10);

a generally horizontal flexible wall (9) extending underneath the ballast;

a skin (11) extending underneath the upper dome (2) over the ballast (10) and resting upon peripheral portions of the wall (9), the wall (9) being pressed down against the an upper end of the adsorbent mass (4) by the weight of the ballast (10) and skin (11) pressing means (10, 11), wherein it comprises ;

a volume between the flexible wall (9) and the dome (2); and

means (12, 14) for controlling the an element in fluid communication with the volume and being adapted and configured to control a pressure in the volume between the flexible wall (9) and the dome (2).

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Claim 9 (currently amended): The apparatus of claim 8, wherein the volume ~~between the flexible wall (9) and the dome (2) communicates (12; 13)~~ is in fluid communication with one of said first and second chambers.

Claim 10 (cancelled)

Claim 11 (currently amended): The apparatus of claim 9, wherein ~~it~~ the element comprises a line (12) connecting said volume to the second chamber (7).

Claim 12 (currently amended): The apparatus of claim 9, wherein ~~it~~ the element comprises an aperture in the wall forming a passage (13) between said volume and the first chamber (5).

Claim 13 (currently amended): The apparatus of claim 8, wherein:
the adsorbent mass (4) is annular, ~~and ; and~~
the first (5) and second (7) chambers are concentric with respect to each other.

Claim 14 (currently amended): The apparatus of claim 8, ~~for separating components of air, wherein~~ the adsorbent comprising mass comprises at least one zeolite

Claim 15 (new): An apparatus for separating at least one component of a gas mixture by pressure swing adsorption, comprising:
an upper dome;
a bottom end;
generally vertically extending walls extending from the bottom end to the upper dome thereby enclosing a space;
a first vertical chamber adapted and configured to receive the gas mixture to be separated;
a second vertical chamber adapted and configured to collect a separated gas mixture;

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at least one adsorbent mass separating the first and second vertical chambers;

a generally horizontal flexible wall extending underneath the ballast;

a means for pressing, the means for pressing being adapted and configured to press the wall down against an upper end of the adsorbent mass;

a volume between the flexible wall and the dome; and

a means for controlling pressure in fluid communication with the volume and being adapted and configured to control a pressure in the volume.

Claim 16 (new): The apparatus of claim 15, wherein said means for controlling pressure is also in fluid communication with one of said inner and outer chambers.

Claim 17 (new): An apparatus for separating at least one component of a gas mixture by pressure swing adsorption, comprising:

a generally vertically vessel comprising a bottom end, an upper dome and vessel walls extending between said bottom end and said dome thereby enclosing a space, said dome having an aperture therethrough;

an annular perforated shell disposed inside said space, said shell containing an adsorbent mass, outer portions of the shell and inner surfaces of the bottom end, upper dome, and vessel walls defining an outer chamber;

an outlet line extending into the outer chamber and being adapted and configured to collect gas separated by the adsorbent mass from the gas mixture to be separated;

a perforated central tube extending vertically through said shell defining an inner chamber and being adapted and configured to receive the gas mixture to be separated;

a generally horizontal wall extending between said vessel walls and resting upon said shell and adsorbent mass, said horizontal wall and said upper dome defining a volume;

a mass of solid ballast material resting upon said generally horizontal wall; and

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an external line in fluid communication with said aperture and volume and said outlet line.

Claim 18 (new): An apparatus for separating at least one component of a gas mixture by pressure swing adsorption, comprising:

a generally vertically vessel comprising a bottom end, an upper dome and vessel walls extending between said bottom end and said dome thereby enclosing a space;

an annular perforated shell disposed inside said space, said shell containing an adsorbent mass, outer portions of the shell and inner surfaces of the bottom end, upper dome, and vessel walls defining an outer chamber;

an outlet line extending into the outer chamber and being adapted and configured to collect gas separated by the adsorbent mass from the gas mixture to be separated;

a perforated central tube extending vertically through said shell defining an inner chamber and being adapted and configured to receive the gas mixture to be separated;

a generally horizontal wall extending between said vessel walls and resting upon said shell and adsorbent mass, said horizontal wall and said upper dome defining a volume;

a mass of solid ballast material resting upon said generally horizontal wall;
and

a calibrated aperture formed in said horizontal wall thereby providing fluid communication between said inner chamber and said ballast material.

Claim 19 (new): An apparatus of claim 18 further comprising a mass of solid low density material over said ballast material, said mass of low density material taking up a majority of said volume, the low density material having a density lower than that of said ballast material.